Site Summary Update **December 1999**

RED DEVIL MINE (Mercury and Petroleum Hydrocarbons)

Alaska Department of Environmental Conservation ● Division of Spill Prevention and Response

Site Description

The Red Devil Mine is located 2 miles southeast of the village of Red Devil, 8 miles northwest of Sleetmute, and 250 miles west of Anchorage. It encompasses approximately 10 acres of federal land on Red Devil Creek that drains into the Kuskokwim River.

The mine operated from 1933 until 1971 and at one time was the largest operating mercury mine in the United States. An estimated 35,000 flasks of mercury were produced during the life of the mine with one flask equal to one quart in volume weighing 76 pounds. The site consisted of a surface mining area, tailing piles, settling ponds, five large fuel tanks, drum storage areas, and numerous buildings used for housing, laboratories, mill, steam plant and chemical storage.

Threats and Contaminants

Mercury is the primary hazardous substance identified at the site. The mercury ore cinnabar was processed using a thermal system called retorting, in which ore is heated until the mercury vaporizes. Vaporized mercury then condenses as it cools along the sides of vertical condensation pipes, where it flows to a collection point. Vapor leaks and liquid spillage are probable sources of mercury contamination in the soil surrounding the retort facility. Other hazardous substances identified at the mine include: arsenic, lead, and antimony; polychlorinated biphenyls (PCBs) from electrical transformers; petroleum hydrocarbons; various containers of mineral processing chemicals; waste solvent in a drum, and antifreeze crystals.

Public Health and Environmental Concerns

There are areas that exceed the health risk based cleanup levels for mercury at the site that may pose a risk to human health or the environment depending on the level of exposure. There are also potential ecological impacts from the mine that have not been evaluated. Site investigations have indicated mercury contaminated soil and tailings remain at the site above the ADEC cleanup level. Mercury levels in Red Devil Creek and the Kuskokwim River are below the Maximum Contaminant Levels for drinking water but the concentrations have not yet been evaluated under the Alaska Water Quality Standards for potential impacts to ecological receptors. There is also evidence that elevated levels of metals are present in Red Devil Creek both at the mine site and above it indicating that they may be naturally occurring in this mineralized area. The potential human health and environmental risk needs to be further evaluated. It is recommended that the public land records indicate that a potential risk exists at the site from the hazardous substance contamination located there.

Response Actions

The Bureau of Land Management (BLM) conducted waste identification and removal actions in the summer of 1999. Approximately 100 batteries, mercury contaminated slag, mineral processing chemicals, and liquid wastes (petroleum products and solvents) were removed. Five large fuel storage tanks were found to be empty and free of sludge, with no soil contamination identified in adjacent soils. Limited characterization of soils and tailings in the immediate vicinity of the large retort facility documented mercury concentrations as high as 35,000 mg/kg, with elemental mercury visible in some site soils.

Current Status

DEC is in the process of reviewing the 1999 response action. BLM is planning to conduct additional site characterization work in 2000 and is also evaluating alternative cleanup and

stabilization techniques to address the widespread mercury contamination. Given the magnitude of the problem, the time frame for completion of cleanup is estimated at five or more years.